

**IWG-4 Doc. 5 Rev.4**

**UNITED STATES OF AMERICA**

**Sharing between non-GSO FSS and GSO FSS in Ku Band<sup>1</sup>**

**ISSUE:** EPFD limits in the Ku band

**Agenda Item:** 1.13.1

“to review and, if appropriate, revise the power limits appearing in Articles S21 and S22 in relation to the sharing conditions among non-GSO FSS, GSO FSS, GSO broadcasting-satellite service (BSS), space sciences and terrestrial services, to ensure the feasibility of these power limits and that these limits do not impose undue constraints on the development of these systems and services”

**Background Information:**

WRC-97 modified S22 to accommodate the introduction of NGSO FSS systems operating on co-frequency, co-coverage in the Ku-band with operational and future GSO FSS systems. Clearly, the United States supports the introduction of new satellite technologies – both NGSO and GSO.

WRC-97 adopted “provisional” power limits for this purpose that were specifically subject to review, confirmation or modification at WRC-2000 based on more extensive technical analysis. As a result, ITU-R technical group, JTG 4-9-11, was created for the purpose of carefully examining and developing an appropriate way to ensure the future viability of both types of systems. These power limits are significant, in that they constitute a permanent global coordination among NGSO FSS systems and GSO FSS systems.

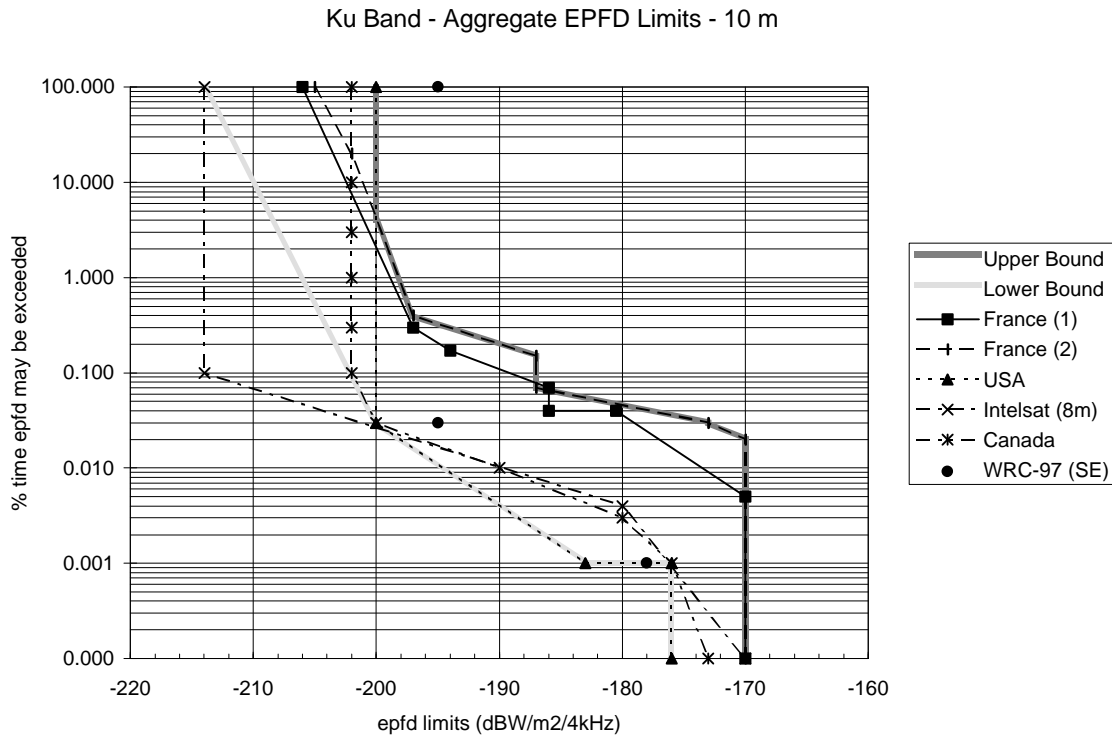
The US believes that a balanced approach is possible and that existing and new satellite technological advances, such as NGSO FSS and evolving GSO FSS systems, can co-exist under the right framework.

**Proposed EPFD Curves Presented at the Long Beach JTG Meeting:**

The JTG 4-9-11 meeting identified upper and lower bounds for aggregate EPFD limits for 10 meter antennas based on the proposals received from administrations. All of the proposals for an aggregate epfd mask are graphed below for a 10 meter antenna. These proposals are from France, Intelsat, Canada and USA.

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<sup>1</sup> There is another US document that addresses non-GSO FSS sharing with GSO BSS.



The figure shows that all of the proposals received, while based on data available at that time, recommend that the provisional limits need to be modified. (Note: The provisional limits shown on the figure are single-entry limits and the rest of the curves represent aggregate epfd limits.)

The JTG also produced figures for GSO FSS earth station antenna sizes of 60 cm, 1.2 m and 3 m. These figures also show that the proposals received recommend that the provisional limits need to be modified.

The meeting agreed that further study was needed to refine and validate the EPFD masks that would be required to protect GSO FSS carriers and to assess the measures that would be needed to ensure protection of those carriers for which the requirements of Rec. S.1323 may not be met when using these masks. To assist administrations in their further consideration of this matter it was suggested that for the 10 m antenna case attention could be confined within the upper and lower bounds shown in the figure. It was agreed that these studies and technical discussion would continue at the ITU Working Party 4A meeting in Geneva from 26 April to 4 May 1999.

For further discussion on these matters, please refer to the Chairman's Report from the 3<sup>rd</sup> Meeting of JTG-4-9-11 (Document 4-9-11/367).

**Other Areas of Agreement within JTG 4-9-11:**

Interference from all NGSO systems to GSO networks should be responsible for 10% of the unavailability time in a GSO network and/or time allowances specified in the performance objectives (BER or C/N) of the GSO network.

EPFD limits should be represented using continuous curves (i.e. epfd as a function of percentage of time).

Aggregate interference levels are converted to single entry levels assuming between 3 to 5 NGSO systems. The exact number is to be determined by WP4A., There is a need for a regulatory regime that ensures that the aggregate NGSO EPFD limits are not exceeded.

Detailed convolution of fading and interference degradations (e.g., Procedure D in the draft revision of ITU-R Recommendation S.1323 produced by the October 1998 meeting of Working Party 4A) should be used to evaluate and refine potential epfd and apfd limits.

**Areas of Further Work to be conducted by WP4A:**

At its April/May 1999 meeting, Working Party 4A will attempt:

To further refine and validate the epfd masks which would be required to protect GSO FSS carriers and to assess the measures that would be needed to ensure protection of those carriers for which the requirements of Rec. ITU-R S.1323 may not be met when using these masks;

To apply Procedure D (defined in the preliminary draft revision of Rec. ITU-R S.1323) to the carriers received by the BR by 15 March 1999 in CR92 Annex 2 format; and

To further review the impact of sync losses on FSS carriers as it relates to the development of the epfd limits.

**US Preliminary View:**

In order for CITELE to have the full benefit of the results of all technical studies by the ITU on this matter it should consider waiting to develop specific epfd values until the next CITELE PCC-III meeting. In the interim all CITELE Administrations are encouraged to participate in the discussions of this subject at the upcoming meeting of WP4A.

**Reason:**

Studies to date show that the “provisional limits” from WRC-97 need to be modified to accomplish the ITU WRC-97 and US goal of protecting GSO systems while accommodating the NGSO FSS systems.